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Identifiers-Marshall High School, Oregon, Portland, Stanford School Scheduling System

The blending of technology with teaching has permitted the introduction of individualized instruction for the total student body at Marshall High School, Portland, Oregon. In conjunction with the School of Education at Stanford University, a computerized modular-flexible schedule was made operational and put to use in September 1963. Prior to implementation, experimental teaching techniques such as team teaching were undertaken, and inservice training workshops for Marshall staff members were used to prepare for the new instructional program. When the program was implemented, the basic schedule was changed from the conventional seven-period day to one divided into 21 20-minute modules. Students, with advisory help, preregister in the spring for the following year. With these student schedules, a master plan is prepared with the use of a computer. Flexibility is permitted by use of four teaching-learning modes--large group instruction, medium-size groups for laboratory activities, small group learning experiences, and independent study. (LN)

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Individualizing Learning through Modular-Flexible Programming

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INDIVIDUALIZING LEARNING THROUGH
MODULAR-FLEXIBLE PROGRAMMING

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Foreword

Within broad state and local requirements and laws, a school faculty in Portland has the freedom to decide what to teach and how to teach. Instructional decisions thus can be made close to the students they will affect, and each school can become a laboratory for the testing of educational ideas and designs.

Marshall High School, under the direction of Principal Gaynor Petrequin, has become such a laboratory. Marshall is exercising its freedom in a creative search for better ways to organize space and time for students. The techniques in use at Marshall, and some tentative conclusions regarding them, are explained in this book.

The basis for all phases of the Marshall Program is found in the recognition that each student does, and must do, his own learning. No one can learn for him. The whole of the program at Marshall is an attempt to individualize instruction—to organize the instructional program so that each of Marshall's 2,200 students is able to adjust the program to fit his individual needs. It is the curriculum that is adapted to the student, rather than the student who is made to fit the curriculum.

Of course, implementation of the program at Marshall—with its diversity of class periods, student schedules, and teacher assignments —would be impracticable, if not impossible, without the aid of computers. The Stanford University School Scheduling System provides the foundation for the individualization that is the heart of Marshall's program.

The increased use of such technology in education is both desirable and inevitable. The danger is that our wisdom will not grow to match our new technology. The blending of technology and teaching at Marshall indicates that we can be optimistic about the ability of our schools to utilize technical achievements in the advancement of education.

Melvin W. Barnes, Superintendent
Portland Public Schools
Portland, Oregon

Preface

Marshall High School has pioneered a system of educational reform. The philosophies undergirding the system are not unique to Marshall High School. They are applicable to all secondary schools that dare to break the "traditional rules and regulations," the lockstep of curriculum and classroom. Marshall's innovations merit consideration by all schools in which there is dissatisfaction with the *status quo*—with the amount of individualization—and with problems of staff use and the extent of pupil responsibility now possible.

In the same way that the innovations at Marshall High School have been a result of a team effort of the entire faculty, staff, administration, and students, the book too represents the cooperation of many persons involved in the program at Marshall High School. This in itself is exciting because Marshall was able to achieve as a cooperative venture a level of quality and excellence that would have been impossible for one person, however dedicated or able.

This volume is designed for teachers, administrators, parents, and the general public—for all who are interested in the report of a successful and substantial educational experiment. Professional educators will find many answers to their respective trouble areas. Parents will receive an insight to educational philosophy coupled with a

better understanding of the school and its relation to the student, family, and community. The general public will recognize the pressing need for alteration.

Computerization, modular-flexible scheduling, team teaching, independent study, and all the other phases referred to in these pages are certainly not set forth as a panacea. Solutions to problems which are the result of generations are never immediate. What is important is that a first step has been taken. The fact that new approaches inevitably initiate new problems should not minimize the effectiveness and success of this program.

The educational goals of Marshall High School include helping a student think for himself. He must criticize, evaluate, and identify himself in relation to his environment. The program and structure of Marshall High School enhances that opportunity. This is true because the flexible structure and organization of Marshall High School allows this to take place, where more rigid programs do not. Large-group instruction, small-group instruction, open laboratories, independent study, and completely unscheduled time as a part of the student's individual curriculum make this possible. But the structure of a program means nothing without the sensitive participation of the staff. The structure does not *cause* a good program; it *allows* a good program to succeed and encourages creative staff efforts.

Concern is a major prerequisite for the administrator who decides to undertake innovation. He must be concerned with the basic educational philosophy of his school, concerned for the community which his school serves, concerned for the welfare of society as a whole, and most important, he must be concerned for the student as an individual. Our democracy has grown, and with advancement has come the industrialization and technicalization of almost all phases of our environment. Mass production and efficiency have become watchwords which have been difficult to translate into sensitive educational programs. Schools have felt this surge of technology and have been caught in the waves of centralization, consolidation, and in most cases, impersonalization. The need to identify the individual as the essential backbone of our democratic structure has become exceptionally apparent. We must devise programs which exploit technology and not the individual in a technological society. All who have been involved in the development of the Marshall program have attempted

to keep this principle as a requisite for all educational decisions. Machines must serve us, not control our educational decisions.

In the new design, the student is most important! The entire program is constructed with this thought in mind. The idea is to identify each and every student. Lectures, impersonal but necessary, can be given to 100 or 200 with equal effectiveness; but the balance comes with individual conferences and small groups, made possible by the use of the large-group presentations. These latter phases allow the individuality of students to surface. Here the student speaks, questions, discusses, and criticizes. Through independent study the pupil learns responsibility, for he must choose how to use his unscheduled time. The resources and opportunities are there; the choice of pursuit lies within the individual. For the first time since the "Little Red Schoolhouse," education may have found a way to base its program on individual needs. The belief in the individual is not new. But the means to implement this belief is new.

When educational offerings are individualized for students' needs and desires and when the program is designed in the light of the abilities and desires of the professional staff administering the program, the curriculum in its entirety must reflect a plan peculiar to that school. Computerization makes possible a framework sufficiently flexible to honor individualistic, personal considerations as well as subject-area peculiarities. In Marshall High School, that which was considered suitable was adopted; that which was not considered suitable was discarded. Such is flexible education. There is still a gap between what we know and what we can do. Compromises have been required and will continue to be needed, but the gap is getting smaller and smaller at Marshall.

Dr. Petrequin's decision to step bravely into innovation required a boldness deserving emulation in all schools seeking to find new levels of quality. The success that Marshall High School has experienced cannot be attributed to new machines or systems but to a staff not afraid to use them.

Dwight W. Allen
Dean, School of Education
University of Massachusetts
Amherst, Massachusetts

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A Computer-Generated, Teacher-Developed, Modular-Flexible Schedule

Gaynor Petrequin and William G. Tapfer

The existing Marshall program was conceived by the Marshall staff as a means of utilizing teacher and student time more effectively than is possible in a traditional program. The major goal is to individualize teaching and learning through the use of a variety of techniques. It involves breaking the school day into small segments (modules) of time so that class sessions might be more closely constructed in length of time and number of meetings in order to fit the activity taking place within the classroom and the characteristics of the students comprising the particular section. Allowances are also made for variations in group size of from six to four hundred students.

About 80 percent of the Marshall staff is organized into approximately forty teaching teams. The four teaching-learning modes utilized are large-group instruction, medium-size groups for laboratory activities, small-group learning experiences, and independent study. The schedule of each student allows for considerable independent study, which is the most valuable time for most students in terms of individualized learning.

ORGANIZING THE PROGRAM

During the school year 1961–1962, a number of exploratory team-teaching situations developed as the result of the experimental attitude which prevailed in the school. Each team consisted of two or three instructors, usually a student teacher, and sometimes the developmental reading teacher. Experimentation during this year led to establishment of additional teams in 1962–1963. During this year, the entire staff was involved in experimentation and in investigation of the possibilities and potential of modular-flexible scheduling. Consultative services were supplied by the School of Education at Stanford University and by other nationally recognized authorities in staff utilization.

In the winter of 1962–1963, a tentative plan was devised and presented to a large Marshall faculty committee including all department chairmen. Their decision to support the revolutionary type of experiment implied was enthusiastic. From the recommendations of this committee, a final plan was prepared and approved by officials of the Portland public schools. Funds were requested under the *Oregon Program.* Oregon Program funds originated from the Ford Foundation and were specified for improving teacher education and for stimulating the assimilation into classrooms of new teaching techniques, new teaching technology, new plans of organization, and new ways of utilizing professional educators, interns, and aides. This cooperative program to improve education involved the state department of education, Oregon colleges and universities, and local school districts in the state. A grant of $60,000 was approved for Marshall High School for the first year to cover anticipated additional cost of the pioneering venture, particularly for in-service education of staff, coordination, and instructional assistance for teachers. The Portland School District made a substantial contribution in terms of administrative services, redeployed staff time, facilities, and materials.

The invitation of Dr. Dwight W. Allen, associate professor of education at Stanford University, to join with the secondary education project at Stanford in producing and implementing a computerized modular-flexible schedule with the aid of the

IBM 7090 computer was accepted by Dr. Gaynor Petrequin, principal of Marshall High School. The proposal—jointly developed by Dr. Petrequin, Roy Carlson, project director, and the district's administrative leaders—called for the administration and faculty of John Marshall High School to develop a program to better meet the educational needs of all students through (1) improving the use of time with increased attention to pupil variables, subject variables, and the talents and training of teachers; (2) combining the benefits of many small experimental programs in widespread parts of the country with some unique ideas developed at Marshall to test the applicability of flexible programming and team teaching to a large urban high school; (3) providing educators in Oregon and the Northwest with a demonstration of administrative and teaching arrangements from which they might derive benefit.

In the spring of the 1962–1963 school year, the staff of each department at Marshall High School was asked the basic question, "How would you like to teach your course next year without the limitations of a conventional schedule?" From the answers given, course structures, teacher team assignments, and room utilization needs were projected. The faculty members were encouraged to think in terms of large- and small-group instruction and various forms of laboratory groups, together with independent study for all students. From the teacher recommendations, the decision was made to divide the school day into 21 twenty-minute modules, or periods of time. Thus, a large-group presentation might be two modules, or forty minutes, less four minutes passing time; and a lab meeting might be as long as five modules, or 100 minutes. Any multiple of these short time blocks could be requested in order to satisfy the needs of the students and of the particular activity taking place in the course. Figure 1–1 illustrates this concept. The faculty also recommended extending the school day by forty minutes to provide more flexibility in the school program.

Following several months of planning course structures, teacher assignments, and room utilization needs, basic input data were submitted to the Stanford Project. After four years of experimentation and the expenditure of considerable resources, Stan-

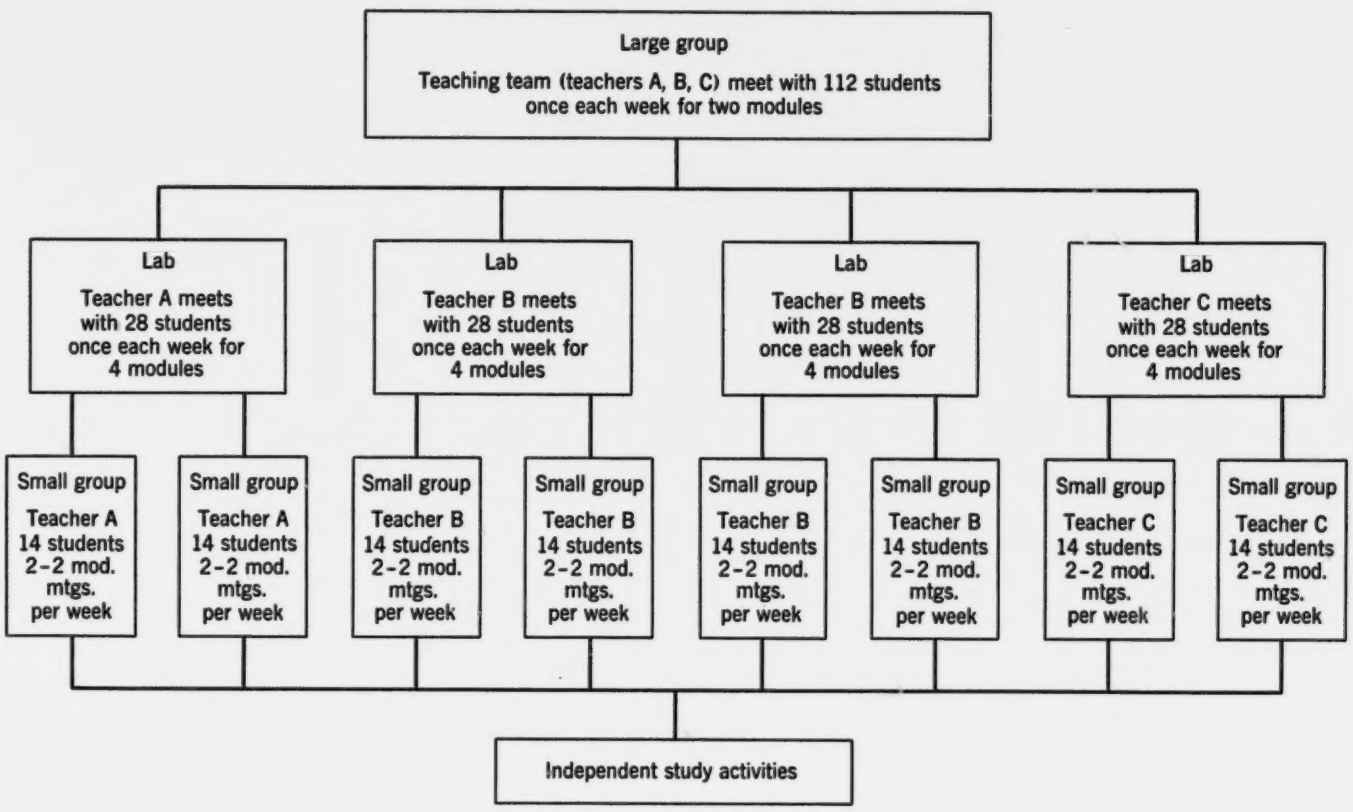
Large group
Teaching team (teachers A, B, C) meet with 112 students once each week for two modules
Lab
Teacher A meets with 28 students once each week for 4 modules
Lab
Teacher B meets with 28 students once each week for 4 modules
Lab
Teacher B meets with 28 students once each week for 4 modules
Lab
Teacher C meets with 28 students once each week for 4 modules
Small group
Teacher A 14 students 2-2 mod. mtgs. per week
Small group
Teacher A 14 students 2-2 mod. mtgs. per week
Small group
Teacher B 14 students 2-2 mod. mtgs. per week
Small group
Teacher B 14 students 2-2 mod. mtgs. per week
Small group
Teacher B 14 students 2-2 mod. mtgs. per week
Small group
Teacher B 14 students 2-2 mod. mtgs. per week
Small group
Teacher C 14 students 2-2 mod. mtgs. per week
Small group
Teacher C 14 students 2-2 mod. mtgs. per week
Independent study activities

FIGURE 1-1. Variable course structure concept chart

ford produced the first computer-generated school program in August, 1963, for Marshall High School.

Because of the pioneering nature of the project, many critical problems were encountered during this first year. The machine process was successful in scheduling all variables that were anticipated; however, there was considerable need for improvising by the faculty in order to put the program into operation in September, 1963. At any rate, a great forward step had been taken. The "lockstep" and "eggcrate" format of secondary education was decisively broken, and the possibility of implementing new methods of teaching and learning was provided.

IN-SERVICE TRAINING

In addition to the experimentation that took place by certain teachers or teams of teachers during the year prior to implementing the new design, many Marshall staff members attended a two-week Oregon Program workshop. This workshop was designed to acquaint Oregon educators with the general need for educational improvement and with possible innovations in staff organization and teaching techniques which might provide such improvement. In the summer of 1963, the Oregon Program sponsored a secondary team-teaching workshop which was conducted through the cooperative efforts of the state department of education and the Portland public schools. This workshop, held at Marshall and Wilson High Schools in Portland, permitted a number of Marshall teachers to participate. Emphasis was placed on both the theory and practice of team teaching; and from this combined summer high school and teacher workshop came reactions from students and teachers, indications of building needs, and experience in the use of paraprofessionals. As an in-service activity to affect teacher attitudes and behavior, this workshop was phenomenally successful.

Prior to the start of the 1963–1964 school year, all department chairmen and some teaching-team leaders participated in a local ten-day workshop. The entire faculty at Marshall returned to the school two days early for a general workshop in techniques of large-group presentation, small-group activities, and independent

study. In succeeding years teacher committees actively engaged in experimentation and exploration of these relatively new teaching modes. These experienced teachers then became "experts" in the field and, at the beginning of each school year, helped the Marshall administrators train teachers who were new to the staff.

MODIFICATION OF FACILITIES

The Marshall program provides for resource centers, team planning areas, individual study spaces for students, office space for teachers, and a student union area to be used by students for relaxation. Since the school building was relatively new and of modern design, it had such features as conference rooms, combined rooms with folding doors, and a small auditorium seating 400 which was adaptable for large-group presentations. Since the inception of the new program, building modifications have been made to provide teacher office space. Five standard-size classrooms were each divided in half to provide ten smaller rooms for use by small groups. Also, two walls were removed to provide adequate resource-center space. A few other minor building changes were made.

THEORY INTO PRACTICE

Under the new design, the basic time framework was changed from a conventional seven-period day of fifty-five minutes per period to a twenty-minute modular schedule consisting of 21 modules per day, or 105 modules per weekly cycle. Each school day begins with an eleven-minute registration period during which an attendance check is made, daily announcements are read, and teachers have an opportunity to work with individuals in the registration room regarding their academic progress. The first module of the school day following the registration period begins at 8:20 A.M., and dismissal time is 3:15 P.M. All students are required to remain on the campus during the school day unless early dismissal has been granted for a specific reason or they need to do off-campus research. Originally the program

included a one-hour block of time on Friday mornings for school activities such as assemblies and class meetings. This had the advantage of not encroaching on class time for any of these activities. After three years, however, it was felt that students wanted an alternate time schedule in order to schedule assemblies any day of the week. This was done by eliminating two minutes from each module on assembly days and has proved to be quite satisfactory. It allows for more flexibility during the school week for the variety of special activities that take place. Lunchtime consists of any two consecutive modules from module 10 to 16. This is not on an assigned basis; students may eat at any time within this block that they have unstructured time. Occasionally a student may have only one module for lunch in order to avoid a conflict in an otherwise satisfactory schedule. This has not been considered a hardship by students.

As is customary in a secondary school, each student preregisters in the spring for his program of studies for the following year. The program of modular scheduling allows for extensive orientation so that students can make intelligent choices. This involves contact with each of the "feeder" elementary schools, parent and student visits, school-newspaper description of courses, open classes for direct observation by students, student-parent worksheets, and most importantly, individual conferencing of each student with his counselor within a ten-day period of time.

It would be physically impossible to manually prepare a master program with the complexity of the design used at Marshall or to assign the entire student body by hand to individual class sections; therefore, this function continues to be performed at Stanford University using the IBM 7090 computer. Although the computer is necessary to generate the master schedule and load students into the schedule, it is necessary later to make some manual adjustments for certain individual students and to hand-schedule students new to the school.

A better understanding of the individual student's schedule can be gained by a study of the student program of Mary Jones, a junior, and of John Smith, a freshman, Figures 1–2 and 1–3. These schedules would be considered typical for most Marshall students, although it would be difficult to locate two identical

Reg. room _____

Student Program
John Marshall High School
3905 S.E. 91st Avenue
Portland, Oregon 97266

Name Jones (Last) Mary (First)

Counselor _____

Sex M (F) Year in school 9 10 (11) 12

B schedule starting time	Module	A schedule starting time	Monday			Tuesday			Wednesday			Thursday			Friday		
8:05	Reg.	8:05	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher
9:01	1	8:20	H5-6 Lab	A25	Robin.							SB1-2 Lab	C17	Voit			
9:19	2	8:40	"	"	"				G3-4 Lab	C32	Neelan	"	"	"	G3-4 Lab	C32	Neelan
9:37	3	9:00	"	"	"				"	"	"	"	"	"	"	"	"
9:55	4	9:20	"	"	"							"	"	"			
10:13	5	9:40							E5-6B Lab	B47	Lane	"	"	"	E5-6B Lab	B47	Lane
10:31	6	10:00	SB1-2 SG	C17	Voit				"	"	"				"	"	"
10:49	7	10:20	"	"	"	G3-4 LG	C32	Sager	"	"	"				"	"	"
11:07	8	10:40				"	"	"									
11:25	9	11:00															
11:43	10	11:20	G3-4 MG	C33	Sager	Lunch			G3-4 MG	C33	Sager	G3-4 MG	C33	Sager	G3-4 MG	C33	Sager
12:01	11	11:40	"	"	"	Lunch			"	"	"	"	"	"	"	"	"
12:19	12	12:00	E5-6B SG	B44	Lane	SB1-2 LG	B67	Tsuboi	H5-6 LG	B67	Robin.	SB1-2 LG	B67	Tsuboi	Lunch		
12:37	13	12:20	"	"	"	"	"	"	"	"	"	"	"	"	Lunch		
12:55	14	12:40	Lunch						Lunch			Lunch			E5-6B LG	B67	Team
1:13	15	1:00	Lunch						Lunch			Lunch			"	"	"
1:31	16	1:20				SS5-6 SG	B28	Simpson	SS5-6 SG	B28	Simpson	SS5-6 SG	B28	Simpson			
1:49	17	1:40				"	"	"	"	"	"	"	"	"			
2:07	18	2:00													H5-6 SG	A25	Robin.
2:25	19	2:20													"	"	"
2:43	20	2:40							SS5-6 LG	B67	Sturd.				SS5-6 LG	B67	Sturd.
3:01	21	3:00							"	"	"				"	"	"

3:15 Dismissal

FIGURE 1-2

Reg. room _____

Student Program
John Marshall High School
3905 S.E. 91st Avenue
Portland, Oregon 97266

Name Smith (Last) John (First)

Counselor _____

Sex (M) F Year in school (9) 10 11 12

B schedule starting time	Module	A schedule starting time	Monday			Tuesday			Wednesday			Thursday			Friday		
8:05	Reg.	8:05	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher
9:01	1	8:20	IA1-2 LG	B67	Team	IA1-2 Lab	A28	Balzer				IA1-2 Lab	A28	Balzer			
9:19	2	8:40	"	"	"	"	"	"	MuB5-8	B57	Salyard	"	"	"	MuB5-8	B57	Salyard
9:37	3	9:00				"	"	"	"	"	"	"	"	"	"	"	"
9:55	4	9:20				"	"	"	"	"	"	"	"	"	"	"	"
10:13	5	9:40				E1-2 Lab	B8	Fiser									
10:31	6	10:00				"	"	"	PE1-2 Lab	Gym	Chris.				PE1-2 Lab	Gym	Chris.
10:49	7	10:20				"	"	"	"	"	"				"	"	"
11:07	8	10:40							"	"	"				"	"	"
11:25	9	11:00							"	"	"				"	"	"
11:43	10	11:20				SS1-2 SG	B27B	Lindsay	Lunch			SS1-2 SG	B27B	Lindsay	IA1-2 IL	A28	Balzer
12:01	11	11:40	Lunch			"	"	"	Lunch			"	"	"	"	"	"
12:19	12	12:00	Lunch			PE1-2 Lab	Gym	Chris.				Lunch			Lunch		
12:37	13	12:20	MuB5-8 HB	B67	Salyard	"	"	"				Lunch			Lunch		
12:55	14	12:40	"	"	"	"	"	"	E1-2 SG	B6	Fiser				E1-2 SG	B6	Fiser
1:13	15	1:00	"	"	"	Lunch			"	"	"				"	"	"
1:31	16	1:20	E1-2 LG	A30	Team	E1-2 LG	A30	Team	SS1-2 Lab	B67	Lindsay						
1:49	17	1:40	"	"	"	"	"	"	"	"	"						
2:07	18	2:00				"	"	"	"	"	"						
2:25	19	2:20	MA1-2 MG	C55	Schmid	MuB5-8	B67	Salyard	MA1-2 MG	C55	Schmid	MA1-2 MG	C55	Schmid	MA1-2 MG	C55	Schmid
2:43	20	2:40	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
3:01	21	3:00	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

3:15 Dismissal

FIGURE 1-3

schedules. Mary Jones, an average student, consulted with her counselor in February or March and then preregistered for Junior English, American History, second-year German, Biology, and third-year Home Economics. In each course, the structure has been designed by the teacher or teaching team for that subject. As an example, Mary will start her English cycle on Friday with a two-module large group. This large group will involve all students of average ability taking Junior English (approximately 300). On Monday she will meet with a small group numbering between 6 and 15 students. On Wednesday and Friday she has a three-module English lab (30 to 60 students) devoted to skill-building activities. Mary has the same teacher for all phases of her English course with the exception of the large group, which has a team of two teachers. Mary Jones has forty modules of unstructured time during the week which she may use in any or all of the following ways:

Work in an open lab (home economics, foreign language, biology)
Study in the library
Study in a resource center (seven available)
Conference with her teachers or counselor
Relax in the student union
Participate in a prerogative (noncredit, enrichment) course
Pursue independent-study project (possibly off campus)
Visit interesting classes (large and small groups)
Serve the school in the capacity of teacher assistant or assistant to a resource-center aide

John Smith is a freshman boy and has more structure during the week than Mary Jones. His program consists of twenty-seven modules of unstructured time and is typical of the amount of independent-study time given to freshmen. This program also allows for individual responsibility and decision making on the part of the student, but to a lesser degree than upper-division students.

The teaching assignment and load of each teacher is determined in the spring for the following year. A typical teacher would be involved in class activity for approximately two-thirds of his teaching time. The one-third unstructured time would be devoted primarily to student conferencing, planning, and evaluating student work. If the teacher is a part of a teaching team, a common time (one hour per week) will be designated on his program when all members of that team are able to meet together for planning purposes. Also, each teacher is responsible for about forty minutes of supervision during each week in the student union.

The department chairman has a reduced teaching load, depending upon the size of his department. Lyle Meyer, English department chairman, is responsible for seventeen teachers and has about one-third of his time structured for teaching purposes. The department chairman acts as supervisor to the teachers in his department, meets in a group of department chairmen with the vice-principal for curriculum and instruction and the principal to confer on basic school policies and procedures, has responsibility for his resource center, and supervises clerks and aides within the department. Figures 1–4 and 1–5 detail the program of a teacher and department chairman.

Most teachers involved in a modular-flexible program do not have a single room of their own but rather meet their classes in rooms that are more suitable for the particular learning mode. As an example, a teacher will meet a large group in a room seating a maximum of 400 students. His small-group meetings will be in seminar rooms and medium-size groups in standard lab rooms. This means that most rooms are used by two or more teachers; consequently, the teaching staff must now be provided with office space. At Marshall High School this space was found in many different areas. Small conference rooms are used for this purpose. Some cubicles were constructed, and in one instance, a carpet was laid on the floor of a large custodial storeroom in order to provide adequate facilities for teacher offices. Wherever possible the teacher offices have been located adjacent to resource centers so that teachers and students will have ready access to each other.

Reg. room _____

Teachers' Program
John Marshall High School
3905 S.E. 91st Avenue
Portland, Oregon 97266

Name Meyer (Last) Lyle (First)

Department English

B schedule starting time	Module	A schedule starting time	Monday			Tuesday			Wednesday			Thursday			Friday		
8:05	Reg.	8:05	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher
9:01	1	8:20	E5-6A LG	B48		E5-6A LG	B48		Extended	Reg.	Room	E5-6A Lab	B24		Extended	Reg.	Room
9:19	2	8:40	"	"		"	"		Student conference			"	"		Dep't. supervision		
9:37	3	9:00	Dep't. supervision			E5-6A Team planning			"	"		"	"		"	"	
9:55	4	9:20	"	"		"			E7-8B Lab	B26		"	"		"	"	
10:13	5	9:40	"	"		E7-8B LG	B67		"	"		Student conference			"	"	
10:31	6	10:00	Intern conference			"	"		"	"		E7-8B Lab	B49		E5-6A SG	A13	
10:49	7	10:20	"	"		E5-6A SG	B38		"	"		"	"		"	"	
11:07	8	10:40	"	"		"	"		Student conference			Planning			E5-6A SG	B38	
11:25	9	11:00	Student conference			"	"		"	"		"			"	"	
11:43	10	11:20	"	"		E3-4EE Lab	B 6		"	"		"			Lunch		
12:01	11	11:40	"	"		"	"		"	"		"			"		
12:19	12	12:00	E3-4EE SG	B 6		Lunch			E3-4EESG	B49		Lunch			E3-4EE SG	B49	
12:37	13	12:20	"	"		"			"	"		Lunch			"	"	
12:55	14	12:40	Lunch			E5-6A Team planning			Lunch			E3-4EE Lab	B38		Student conference		
1:13	15	1:00	Lunch			"			"			"	"		"	"	
1:31	16	1:20	Cafeteria duty			E5-6ASG	B46		Dep't. supervision						"	"	
1:49	17	1:40	"	"		"	"		"	"		E7-8B Team planning			"	"	
2:07	18	2:00	Planning			"	"		"	"		"	"		Planning		
2:25	19	2:20	"			Planning			City dep't. chrm.			"	"		"		
2:43	20	2:40	"			"			meeting			Dep't. supervision			"		
3:01	21	3:00	"			"			"			"	"		"		

3:15 Dismissal

FIGURE 1-4

Reg. room A21

Teachers' Program
John Marshall High School
3905 S.E. 91st Avenue
Portland, Oregon 97266

Name Tunks (Last) Roger (First)

Department Industrial arts

B schedule starting time	Module	A schedule starting time	Monday			Tuesday			Wednesday			Thursday			Friday		
8:05	Reg.	8:05	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher	Course	Rm	Teacher
9:01	1	8:20	IA1-2 LG	B67		IA1-2 Lab	A26		Extended	Reg.		IA1-2 Lab	A26		Extended	Reg.	
9:19	2	8:40	"			"			IA1-2 Lab	A26		"			IA1-2 Lab	A26	
9:37	3	9:00	Planning			"			"			"			"		
9:55	4	9:20	IE1-2 Lab	A21		"			"			"			"		
10:13	5	9:40	"			Planning			"			Open lab	A21		"		
10:31	6	10:00	"			"			Planning			"			IA3-4 LG	B67	
10:49	7	10:20	"			IE3-4 Lab	A21		"			"			"		
11:07	8	10:40	Open lab	A21		"			IA5-6 LG	B67		"			Planning		
11:25	9	11:00	"			"			"			"			"		
11:43	10	11:20	"			"			Lunch			Lunch			IA1-2 IL	A26	
12:01	11	11:40	"			Lunch			Lunch			Lunch			"		
12:19	12	12:00	"			Lunch			Open lab	A21		IE3-4 IL	A21		Lunch		
12:37	13	12:20	Lunch			Student conference			"			"			Lunch		
12:55	14	12:40	Lunch			"	"		"			Student conference			Planning		
1:13	15	1:00	Planning			"	"		"			"	"		"		
1:31	16	1:20	AC1-2 IL	A26		IA1-2 IL	A26		AC1-2 IL	A26		"	"		AC1-2 IL	A26	
1:49	17	1:40	"			"			"			IE1-2 IL	A30		"		
2:07	18	2:00	"			IE1-2 Lab	A21		"			"			"		
2:25	19	2:20	Student conference			"			Team planning			Student conference			Student conference		
2:43	20	2:40	"	"		"			" "			Supervision			"	"	
3:01	21	3:00	"	"		"			" "			"			"	"	

3:15 Dismissal

FIGURE 1-5

During the first four years of modular-flexible scheduling at Marshall High School, many changes took place. As would be expected in a program of this complexity, teachers have had considerable opportunity to experiment with how students learn best. They have used the flexibility available to structure their courses in order to more closely meet the needs of the individual. The value of more than one large-group meeting during the week for a single course has been questioned by most teachers, serious consideration has been given to the ideal length of time for small-group meetings, and maximum attention spans have been observed in various activities. The open-laboratory concept seems to be accepted by a growing number of teachers. Perhaps most important, teachers have found that given the opportunity, most students can become responsible to a large degree for their own education. Under the new design, school has become more interesting for teachers and students alike.

The need for continual curriculum assessment and modification is more apparent in this system, since teachers working together in teams are much more prone to question traditional practices as they assess their course objectives in terms of their particular students. As a result, teachers are moving into interdisciplinary curriculum approaches and into the area of *performance curriculum,* in which the criterion of time is replaced with one of performance. Certainly modular-flexible programming cannot be considered a panacea for the education of all students, but in the minds of the Marshall staff it has provided a vehicle to satisfy more closely the needs of each individual in this school.